AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A system for improving the performance of a distance-type protective relay for power systems, wherein the relay includes a calculation circuit responsive to voltage and current values from the power line to produce a quantity analogous to the distance between the relay and a fault on the power line, wherein the quantity is applied to a distance element for comparison of said quantity with a setting reach value for a selected zone of protection, the system comprising:

a filter circuit responsive to said quantity for filtering said quantity before the quantity is applied to the distance element, resulting in noise attenuation of the quantity; and

a control circuit for controlling the application of the filtered quantity to the distance element such that the filtered quantity is applied only when said quantity is above a preselected first threshold value and below a preselected second threshold value.

2. (Previously Presented) The system of claim 1, wherein the preselected first threshold value is a selected percentage of the setting reach value.

3. (Previously Presented) The system of claim 2, wherein the selected percentage is 100% minus an error of the system plus 5% for the relay.

4. (Canceled)

5. (Previously Presented) The system of claim 2, wherein the selected percentage is approximately 92%.

6. (Previously Presented) The system of claim 1, further comprising a circuit for pre-charging the filter to the preselected second threshold value when said quantity decreases to the preselected second threshold value from said high value, in response to a fault.

7. (Previously Presented) The system of claim 1, wherein the preselected second threshold value is approximately four times the setting reach value.

8. (Previously Presented) An apparatus for selecting one of a filtered m value and an unfiltered m value provided to a distance element of a protective relay providing protection for a transmission line of a power system, the protective relay including a calculation circuit adapted to provide the unfiltered m value indicative of a distance between the protective relay and a fault, and a filter adapted to filter the unfiltered m value to form the filtered m value, the apparatus comprising:

a first comparator including an output determined by a first input configured to receive the unfiltered m value and a second input configured to receive a first percentage of a zone reach value, the first percentage of the zone reach value greater than the zone reach value;

a second comparator including an output determined by a first input adapted to receive the unfiltered m value and a second input adapted to receive a second percentage of the zone reach value, the second percentage of the zone reach value less than the zone reach value, and

a logic circuit coupled to the first comparator and the second comparator, the logic circuit providing a switched output, the switched output being either the filtered m value or the unfiltered m value based on the values of the first comparator and the second comparator.

9. (Canceled)

10. (Previously Presented) The apparatus of claim 8, wherein the filter is charged immediately after the unfiltered m value is equal to or less than the first percentage of the zone reach value, the unfiltered m value equaling the first percentage of the preselected setting indicating an occurrence of a fault in the transmission line.

11. (Previously Presented) The apparatus of claim 8, wherein filter operation is defined by ms_{k-1}.

12. (Canceled)

13. (Canceled)

14. (Previously Presented) A method for selecting between one of an unfiltered m value and a filtered m value provided to a distance element of a protective relay providing protection for a transmission line of a power system, the protective relay including a calculation circuit adapted to provide the unfiltered m value indicative of a distance between the protective relay and a fault, and a filter adapted to filter the unfiltered m value to form the filtered m value, the method comprising:

comparing the unfiltered m value to a first percentage of a zone reach value to form a first binary output, the first percentage of the zone reach value greater than the zone reach value;

providing the unfiltered m value to the distance element when the first binary output comprises a low binary value or when the second binary output comprises a high binary value; and

providing the filtered m value to the distance element when the first binary output comprises a high binary value and the second binary output comprises a low binary value.

15. (Previously Presented) The method of claim 14, wherein the first binary output has a binary high value when the first percentage of the zone reach value is greater than the unfiltered m value, and has a binary low value when the first percentage of the zone reach value is less than the unfiltered m value, and wherein the second binary output has a binary high value when the second percentage of the zone reach value is greater than the unfiltered m value, and has a binary low value when the second percentage of the zone reach value is less than the unfiltered m value.

16. (Previously Presented) The method of claim 14, wherein the filter is charged immediately after the unfiltered m value is equal to or less than the first percentage of the zone reach value, the unfiltered m value equaling the first percentage of the preselected setting indicating an occurrence of a fault in the transmission line.

17. (Previously Presented) The method of claim 14, wherein the filter operation is defined by ms_{k-1}.

18. (Canceled)

19. (Canceled)